DEPARTMENT of GENERAL SERVICES
STATE OF IOWA
CAPITOL COMPLEX

Confined Space
&
Permit Required Confined Spaces Program

Prepared by
Health and Safety Consultant
Occupational Safety Programs
November 13, 1998

PREFACE

Department of General Services, Health and Safety Consultant, recognizing the need to protect employees from potential safety hazards that may be encountered during entry into a confined space, has developed this Confined Space Entry Program. This program is intended to assure that:

- All workers who are required to enter into a permit required confined space are properly trained and supervised.
- Procedures are in-place to prevent employee exposure to hazardous atmospheres or conditions.

This program includes provisions for employee training, hazard identification and control, an entry permit system, and rescue procedures. Supervisors authorized by their Department will assure that the procedures described in this policy are followed and that employees entering confined spaces are properly trained and equipped to perform their duties safely.

Index

1.0 Introduction to the Confined Space Entry Program

A. The principal objective of the Confined Space Entry Program is to implement practices and procedures that will protect employees from hazards that may exist in permit-required confined spaces. This objective is met by:

1. The survey, inventory and evaluation of the workplace to determine if any spaces are permit-required confined spaces.

2. Posting appropriate signage and providing training to individuals so that they recognize and will not enter permit-required confined spaces unless authorized.

3. Training individuals who will enter permit-required confined spaces.

4. Developing written entry practices and procedures, and by establishing atmospheric testing requirements.

5. Implementing a permit system to control and monitor entry into permit-required confined spaces.

B. This program has been designed to comply with Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.146.

1.1 Who Should Participate

A. All Divisions that work in permit-required confined spaces will be impacted by this regulation. The Safety & Health consultant will, in cooperation with these Capitol Complex Maintenance, inventory and evaluate Complex confined spaces to determine if any of these spaces are permit-required. Mechanical Bureau Supervisor will designate an individuals to assist with this inventory and evaluation. This individual will, in addition, serve as Division- liaison with the Safety & Health Consultant as the Confined Space Entry Program is implemented.

B. The Confined Space Entry Program is administered by the Safety & Health Consultant S&H.Consultant will:

1. Monitor the overall effectiveness of the permit system,

2. Provide centralized recordkeeping,

3. Assist with atmospheric testing and equipment selection as needed,

4. Assist with employee training, and

5. Provide technical assistance to the departments as needed.

C. Other key participants include:

1. Workers who enter permit-required confined spaces

2. Bureau supervisors (referred to in this document as the "Supervisor") who will evaluate and monitor entry conditions, issue and revoke entry permits, and who will coordinate work activities with the Safety & Health Consultant.

1.2 Background

A. A confined space is a space that is:

1. Large enough for an employee to enter and perform assigned work; and

2. Has limited or restricted means for entry or exit; and

3. Is not designed for continuous employee occupancy.

B. A permit-required confined space means a confined space that has one or more of the following characteristics:

1. Contains or has the potential to contain a hazardous atmosphere;

2. Contains a material that has the potential for engulfing an entrant;

3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section, or,

4. Contains any other recognized serious safety or health hazard (such as noise, electricity, radiation, or moving parts of machinery).

1.2.1 Hazardous Atmospheres:

The lack of natural ventilation, the presence of stored materials (such as chemicals), or the work process to be performed in a confined space can result in one or more of the following:

A. **Oxygen-deficient atmospheres.**

1. An oxygen-deficient atmosphere has less than 19.5% available oxygen. Any atmosphere with less than 19.5% oxygen shall not be entered without an approved self-contained breathing apparatus (SCBA).

2. The oxygen level in a confined space can decrease because of work done, such as welding, cutting or brazing, or it can be decreased by certain chemical reactions (for example, the rusting of metal) or through bacterial action.

3. The oxygen level can also decrease if oxygen is displaced by another gas, such as carbon dioxide or nitrogen.

B. **Flammable atmospheres.** For an atmosphere to be flammable, there must be:

1. Oxygen in the air; and,

2. A flammable gas, vapor, or dust present in the proper proportion.

Different gases have different flammable ranges. If a source of ignition (such as a sparking or electrical tool) is introduced into a space with a flammable atmosphere, an explosion will result.

C. **Toxic atmospheres.** Most substances (liquids, vapors, gases, mists, solid materials, and dusts) can present a hazard in a confined space. Toxic substances can come from the following:

1. A product stored in the space.

2. The work being performed in the space. Examples include welding, cutting, brazing, painting, scraping, sanding, degreasing, use of solvents, etc.

3. Toxic materials stored in areas adjacent to the confined space. Examples include chemicals or fuel stored in leaking underground storage tanks, or sections of the steam tunnels that may overlay or lie adjacent to a leaking sewer system.

1.2.2 Other Potential Safety Hazards

A. Many Capitol Complex confined spaces, such as the steam tunnels, may have greatly elevated temperatures which can increase the risk of heat stress or heat stoke.

B. A permit space must be isolated, or removed from service, and completely protected against the release of energy or materials into the space. This is accomplished by:

1. Blanking, blinding, misaligning or removing sections of lines, pipes or ducts;

2. A double block and bleed system;

3. Lockout or tagout of all sources of energy, including mechanical, electrical, chemical, pressurized systems, thermal (e.g. systems which operate at a temperature, either hot or cold, that could cause physical injury upon contact) or potential (for example, elevated platforms that could shift and then lower upon an entrant);

4. Blocking or disconnecting all mechanical linkages to prevent movement.

C. The material contained in the space may present a hazard to entrants. It may, for example, be flammable, corrosive, or toxic.

2.0 DEFINITIONS

"Acceptable entry conditions" means the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

"Atmosphere-controlled confined space" means a permit-required confined space in which potential or actual atmospheric hazards can be eliminated prior to entry or can be controlled with continuous forced mechanical ventilation.

"Attendant" means an individual stationed outside the permit spaces who monitors the authorized entrants and who performs attendant's duties as required by this program.

"Confined space" is any space that is large enough and so configured that an employee can bodily enter and perform assigned work, has limited or restricted means for entry or exit, and is not designed for continuous employee occupancy.

- Confined spaces include, but are not limited to: storage tanks, pits, vats, vessels, sewer manholes, electrical manholes, vaults, pump or lift stations, septic tanks, boilers, pipelines, tunnels, ventilation and exhaust ducts, trenches, and excavations.

- Common hazards associated with confined space entry include: oxygen deficient atmospheres, flammable/explosive atmospheres, toxic atmospheres, engulfment/ entrapment hazards, and/or chemical, electrical or mechanical hazards.

"Control Measures" means a system or device used, or action taken, to control or prevent the introduction of physical hazards into a confined space. Control measures include:

"Blanking or blinding" means the absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

"Double block and bleed" means the closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

"Inerting" means the displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible. ***Note that this procedure produces an IDLH oxygen-deficient atmosphere*** that can only be entered using self-contained breathing apparatus (SCBA).

"Isolation" means the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

"Line breaking" means the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

"Lockout-tagout" means placing locks or tags on the energy isolating device (e.g. breaker boxes, control switches, valves, etc.) to prevent the unauthorized reenergization of the device or circuit while work is being performed by personnel. Tags shall indicate that the energy isolated device shall not be operated until the tag is removed by the individual(s) that installed the tag.

"Zero Mechanical State" means that the mechanical potential energy of all portions of the machine or equipment is set so that the opening of the pipe(s), tube(s), hose(s) or actuation of any valve, lever, or button will not produce a movement which could cause injury.

"Department" means any DGS Division that performs work in a confined space **or** permit required confined space. This includes, but is not limited to: Administration & Purchasing, Building Services, Capitol Complex Maintenance, Design & Construction, Fleet & Mail, and Printing & Imaging.

"Emergency" means any occurrence or event inside or outside of the permit space that could endanger entrants.

"Engulfment" means the surrounding of a person by finely divided solids or a liquid. A worker in a storage tank filled with sawdust, for example, could fall into an air pocket, be completely surrounded by sawdust, and suffocate to death.

"Entrant" means any employee who enters a confined space.

"Entry" means any action resulting in any part of the employees' body breaking the plane of any opening of the permit-required confined space, and includes any work activities inside the confined space.

"Entry Permit" means the employers' written authorization for employee entry into a confined space under defined conditions for a stated purpose during a specified time.

"Entry Supervisor", or "Supervisor" means the division or bureau person responsible for determining if acceptable entry conditions are present in a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by this document.

"Ground-fault circuit-interrupter" is a device designed to disconnect an electric circuit when it seeks ground through a person or grounded object, thus preventing electric shock and fires.

"Hazardous Atmosphere" means an atmosphere presenting a potential for death, disablement, injury, or acute illness from one or more of the following causes:

- A flammable gas, vapor or mist in excess of 10% of its' lower flammable limit (LFL)
- An oxygen deficient atmosphere containing less than 19.5% oxygen by volume or an oxygen enriched atmosphere containing more than 23.5% oxygen by volume
- Airborne combustible dust at a concentration that meets or exceeds its LFL (airborne combustible dust which obscures vision at five feet or less)
- An atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, *Occupational Health and Environmental Control*, or in subpart Z, *Toxic and Hazardous Substances,* which could result in an employee exposure in excess of its dose or permissible exposure limit, and that could cause death, incapacitation, impairment of ability to self-rescue, injury or acute illness.
- Any other atmospheric condition that is immediately dangerous to life or health (IDLH).

"Hot work permit" means the employer's written authorization to perform operations (for example, welding, cutting, burning or heating) capable of providing a source of ignition.

"Immediately dangerous to life or health (IDLH)" means any condition that poses an immediate or delayed threat to life, or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

"Non-permit confined space" means a confined space that does not contain or have the potential to contain any hazard capable of causing death or serious physical harm.

"**OSHA**" means Occupational Safety and Health Administration

"**Permit-required confined space**" means a confined space that has one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere;
- Contains a material that has the potential for engulfing an entrant;
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section, or,
- Contains any other recognized serious safety or health hazard (such as noise, electricity, radiation, or moving parts of machinery).

"**Permit-required confined space program**" means the DGS overall program for controlling and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

"**Permit system**" means the DGS written procedures for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

"**Prohibited condition**" means any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

"**Qualified person**" means an entry supervisor who is trained to recognize and evaluate the anticipated hazard(s) of the confined space and who shall be capable of specifying necessary control measures to assure worker safety.

- The department shall designate an employee(s) as qualified person for the purposes of assuring safe confined space entry procedures and practices at a specific site. The qualified person may also be an entrant when permissible according to this standard.
- Where the department is unable to designate a qualified person, then the department shall coordinate work activities with the Safety Coordinator or their designee.

"**Rescue Team**" means those persons whom the employer has designated prior to any permit-required confined space entry to perform rescues from confined spaces.

"**Retrieval System**" means the equipment used for non-entry rescue of persons from permit spaces, and includes retrieval lines, chest or full body harness, and a lifting device or

anchor. A retrieval line is primarily of use in vertical confined spaces, and shall not be used in confined spaces consisting of horizontal tunnels or spaces where obstructions could increase the hazard to the entrant during emergency non-entry removal.

"Safety Coordinator" means the person(s) designated by the Safety & Health consultant to oversee the Confined Space Entry Program. The Safety Coordinator will, in cooperation with the departments, assist in the evaluation of confined space hazards, provide centralized recordkeeping for all records related to this program, will ensure that entry conditions are monitored and that hazards are properly controlled, and will review the efficacy of the program on an annual basis.

"Testing" means the process by which the hazards that may confront entrants to a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

3.0 Program Elements

3.1 Training and Duties of Program Participants

A. All personnel involved in confined space work shall receive appropriate training in hazard recognition, personal protective equipment, safety equipment, communications equipment, procedures for calling rescue services, and proper use of rescue equipment.

B. Training shall be performed before the employee is assigned duties in permit-required confined spaces.(supervisor will be responsible for new employee training)

C. Training will be conducted under the coordination of Bureau supervisors. Retraining will be performed at least annually.

D. Training records will be maintained by the Bureau Supervisors. These records shall include the date(s) of the training program, the instructor(s) of the training program, a copy of the written material presented, and the names of the employee(s) to whom the training was given. The costs associated with training shall, if necessary, be borne by the Department and past back to the Divisions.

3.1.1 Training and Duties of the Authorized Entrant

All personnel involved in entry into permit-required confined spaces shall receive appropriate training which shall include, at a minimum:

A. The requirements of this program and the conditions that must be met for entry into a permit-required confined space.

B. The conditions or work practices that may produce a hazard in a non-permit confined space that may require that the space be reevaluated by the Supervisor prior to entry.

C. Hazard recognition and use of atmospheric testing devices, including information on the mode, signs or symptoms, and consequences of exposure.

D. The use of personal protective equipment including rescue harnesses, respiratory protection, and so forth.

E. Entry procedures and precautions to include:

1. Maintaining communication with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space;

2. Alerting the attendant whenever:

   a) The entrant recognizes any warning sign or symptoms of exposure to a dangerous situation, or

   b) The entrant detects a prohibited condition.

F. Requirement to evacuate whenever so ordered by the entry supervisor or attendant, whenever the entrant recognizes any warning sign or symptom of exposure to a dangerous situation, if the entrant detects a prohibited condition, or whenever an evacuation alarm is activated.

G. Emergency and non-entry rescue methods, and procedures for calling rescue services.

3.1.2 Training and Duties of the Attendant

The attendant shall receive the Worker Training detailed above and shall, in addition, receive training on the following:

A. Hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure;

B. Possible behavioral effects of hazard exposure in authorized entrants.

The attendant shall:

A. Continuously maintain an accurate count of authorized entrants in the permit space and ensure that the means used to identify authorized entrants accurately identifies who is in the permit space;

B. Remain outside the permit space during entry operations until relieved by another attendant;

C. Communicate with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space;

D. Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions:

   1. If the attendant detects a prohibited condition;

   2. If the attendant detects behavioral effects of hazard exposure in the authorized entrants;

3. If the attendant detects a situation outside the space that could endanger the authorized entrant; or,

4. If the attendant can not effectively and safely perform the requirements of this section.

E. Summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards.

F. Warns unauthorized persons to stay away from the permit space, advises the unauthorized persons that they must exit immediately if they have entered the permit space, and informs the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space.

G. Performs non-entry rescues as specified herein.

H. Performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

3.1.3 Training and Duties of the Entry Supervisor

The entry supervisor shall receive training as for attendant, above, and additional training as required to evaluate confined space hazards. The entry supervisor shall:

A. Know the hazard(s) that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure. This information will be contained on the Permit-required Confined Space Evaluation Form for the space in question.

B. Verify, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.

C. Terminate the entry and cancel the permit when either the entry operations covered by the entry permit have been completed or a condition that is not allowed under the entry permit arises in or near the permit space.

D. Verify that rescue services are available and that the means for summoning them are operable.

E. Remove unauthorized entrants.

F. Determine, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

3.1.4 Training and Duties of Rescue and Emergency Services

A rescue team will be provided by the City of Des Moines Iowa, Fire Department. Rescue workers will be trained in hazard recognition, use of all required personal protective equipment, and rescue procedures. Each member of the rescue team shall also receive the training required of authorized entrants as detailed above and as required by the regulations.

3.1.5 Contractor Awareness, Duties and Responsibilities

A. When the Department arranges to have employees of another employer perform work that involves permit space entry, the Department shall:

1. Inform the contractor in writing that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements set forth by OSHA (e.g. 29 CFR 1910.146).

2. Apprise the contractor of the elements, including the hazard(s) identified and the Departments experience with the space, that make the space in question a permit-required confined space.

3. Apprise the contractor of any precautions or procedures that the host employer has implemented for the protection of Capitol Complex employees in or near the permit space where contractor personnel will be working.

4. Coordinate entry operations with the contractor when both Department of General Services personnel and contractor personnel will be working in or near permit spaces.

5. Debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations.

B. All records associated with the above section shall be maintained as a part of the permanent record with the terminated entry permit(s).

C. Each contractor who is retained to perform work that will require permit space entry operations shall:

1. Obtain any available information regarding permit space hazards and entry operations from the Department, (usually the Mechanical Bureau)

2. Coordinate entry operations with the Department when both the contractor and DGS personnel will be working in or near permit spaces, and

3. Inform the Department of the permit space program that the contractor will follow and of any hazards confronted or created in permit spaces, either during a debriefing or during entry operations.

3.2 Identification of Permit Required Spaces

A. A survey of the Capitol Complex will be conducted to identify , inventory and assess all potential permit-required confined spaces. The survey will be conducted by the Safety Coordinator in cooperation with the Departments.

1. The inventory will be maintained and updated as needed. The inventory shall include an assessment of the hazard(s) associated with each permit-required space.

2. The Safety Coordinator will provide a current inventory of permit required confined spaces to all Divisions, and include it in the DGS Safety Programs Book, which each line supervisor controls for his/her bureau.

3. The current inventory will be included in Appendix B of this document which shall be maintained current by The Safety & Health Consultant.

B. Permit-required spaces which could be inadvertently entered will be labeled as a permit-required confined space. Obvious confined spaces, such as manholes, or confined spaces that are not permit-required, will not be labeled. Signs shall read as follows:

DANGER
PERMIT-REQUIRED CONFINED SPACE
DO NOT ENTER

4.0 ENTRY-RELATED WORK ACTIVITIES

4.1 Atmospheric Testing

A. The atmosphere in all permit-required confined space atmosphere shall be tested for oxygen concentration, combustible gases, and any known or suspected toxic substances prior to entry. A properly calibrated direct reading gas monitor will be used. Direct reading gas detector tubes or other acceptable means may also be used to test potentially toxic atmospheres.

B. Each atmospheric testing instrument shall be calibrated on a schedule and in the manner recommended by the manufacturer except:

1. Any atmospheric testing instrument that has not been used within thirty (30) days shall be recalibrated prior to use.

2. Each atmospheric testing instrument shall be calibrated at least every twelve (12) months by the Department.

3. Copies of calibration records will be forwarded to the Safety & Health Consultant

C. Each atmospheric testing instrument will be field checked immediately prior to use to ensure that it is operating properly.

D. Atmosphere testing will be performed by a person qualified by the Safety & Health..

E. Initial air sampling will be conducted from outside the structure, and will be performed when possible at various levels within the confined space (e.g. at least top, middle and bottom), and around all conduits, pipes, or cables.

F. Where possible, sampling will be started at the top of the vessel or space to detect the presence of lighter than air combustibles and toxins. Sampling may be performed with a remote probe. Intrinsically safe equipment will be used if a flammable atmosphere is present, or is suspected of being present.

G. The atmosphere will be tested in the following order: oxygen concentration, combustible gases, and toxic materials. Results will be written on the entry permit.

1. Atmospheric conditions will be considered unacceptable if:

a) Oxygen levels are less than 19.5% or greater than 23.5% by volume,

b) If a combustible gas is present at greater than 10% of its lower explosive limit (LEL),

c) If a toxic substance exceeds an OSHA or American Conference of Governmental Industrial Hygienists (ACGIH) limit where exposure could result in death, acute illness, or impairment of ability to self-rescue,

d) If an airborne combustible dust obscures vision to five feet or less, or,

e) If any atmospheric condition recognized as immediately dangerous to life or health (IDLH) is present.

2. Unacceptable levels may be indicated on a scale or by a visual alarm and **must** be indicated by an audible alarm.

H. The Safety & Health consultant and the program Supervisor for the Department must be notified immediately if atmospheric conditions are unacceptable. Entry will be prohibited until:

1. Conditions are brought into acceptable limits by purging, cleaning and/or ventilating the space, or,

2. Appropriate respiratory equipment is worn. The respirator protection proposed for the entry must be approved by the Safety Coordinator and the Safety & Health Consultant..

3. Re-testing will be required after purging of the space before entry will be allowed.

I. Atmospheric Testing:

Atmospheric testing is required for two distinct purposes: *evaluation* of the hazards of the permit space and *verification* that acceptable entry conditions for entry into that space.

1. *Evaluation testing.* The atmosphere of a confined space should be analyzed using equipment of sufficient sensitivity and specifically sensitivity and specifically to identify and evaluate any hazardous atmospheres that may exist or arise, so that appropriate permit entry procedures can be developed and acceptable entry conditions stipulated for that space. Evaluation and interpretation of these data, and development of the entry procedure, should be done by, or reviewed by, a technically qualified professional based on evaluation of all serious hazards.

2. *Verification testing.* The atmosphere of a permit space which may contain a hazardous atmosphere should be tested for residues of all contaminants identified by evaluation testing using permit specified equipment to determine that residual concentrations at the time of testing and entry are within the range of acceptable entry conditions. Results of testing(i.e, actual concentration, etc.) should be recorded on the permit in the space provided adjacent to the stipulated acceptable entry conditions.

3. *Duration of testing.* Measurement of values for each atmospheric parameter should be made for at least the minimum response time of the test instrument specified by the manufacturer.

4. *Testing stratified atmospheres.* When monitoring for entries involving a descent into atmospheres that may be stratified, the atmospheric envelope should be tested a distance of approximately 4 feet (1.22 m) in the direction of travel and to each side. If a sampling probe is used, the entrant's rate of progress should be slowed to accommodate the sampling speed and detector response.

5. *Order of testing.* A test for oxygen is performed first because most combustible gas meters are oxygen dependent and will not provide reliable readings in an oxygen deficient atmosphere. Combustible gases are tested next because the threat of fire or explosion is both more immediate and more life threatening, in most cases, than exposure to toxic gases and vapors. If tests for toxic gases and vapors are necessary, they are performed last.

4.2 Isolation

A. Electrical and mechanical sources in a confined space that could be hazardous will be tagged and locked out at the source by each individual or group prior to entry.

B. Belt and chain drives and mechanical linkages on shaft-driven equipment will be disconnected when possible.

C. Mechanical moving parts within a confined space will be secured with latches, chains, chocks, blocks, or other devices.

D. All pumps or lines which convey flammable, injurious, toxic or oxygen displacing gases into a confined space shall be disconnected or shall be effectively isolated to prevent the introduction of a hazard into the space.

4.3 Ventilation

A. Continuous forced mechanical ventilation shall be used in all permit-required confined spaces that contain a known or potential atmospheric hazard.

1. Mechanical ventilation must be used regardless of initial monitoring results if the potential for development of a hazardous atmosphere exists. The potential for a hazardous atmosphere to develop will be determined by the Supervisor in consultation with the Safety Coordinator.

2. If a hazardous atmosphere is detected, employees will not enter the space until the hazardous atmosphere has been eliminated by continuous forced air ventilation.

3. The forced air will be directed to the immediate vicinity where an employee is or will be within the space. Ventilation shall continue until all employees have left the space. If mechanical ventilation should fail during entry operations, all employee shall immediately evacuate the space until ventilation is restored, and re-testing indicates acceptable entry conditions.

4. The method and equipment selected will depend on the size of the confined space and opening, the gases exhausted, and the source of make-up air. Ventilation systems used in flammable atmosphere will be explosion-proof and appropriately rated for the hazard.

B. Local exhaust ventilation shall be used during welding, cutting or other similar operations in confined spaces as necessary to remove harmful gases, smoke and fumes. The confined space will be continuously ventilated if a toxic solvent is used in the space.

C. Oxygen will not be used to ventilate a confined space.

4.4 Entry Permits & Person In Charge

A. A fully completed entry permit will be prepared by a qualified person prior to entry into a permit-required confined space. The qualified person will be in charge of the entry. The qualified person must be approved by the Safety & Health Consultant and the Safety Coordinator. And be on the employee confined space roster.

B. The qualified person will ensure that the permit specifies the location, type of work, personal protective measures, authorized entrants, monitoring equipment, hazards of the permit space, and control measures. If rescue equipment is required, it will be so noted on the permit. The procedure for contacting rescue services will also be included on the permit.

C. The permit will be dated and carry an expiration time limiting the work to one shift. The permit will be updated for each shift, and may be extended to each shift if entry conditions are still acceptable.

D. The person in charge shall sign the permit prior to allowing entry and ensure that entry operations remain consistent with the terms on the permit. The entry will be terminated if a potential hazardous situation occurs which exceeds the conditions authorized on the permit.

E. The permit will be available at the work site outside the confined space.

F. All confined space entry permits will be turned in to the bureau supervisor after the work is completed.

1. A copy of these permits shall be provided to the Safety & Health Consultant.
2. The Safety & Health Consultant and the Bureau supervisor will keep the permits and related information for a minimum of three years.

G. Hot work (potential ignition sources) will be authorized on a separate hot work permit and attached and noted on the entry permit.

H. Individuals authorizing entry into the confined space may also serve as entrants or attendants if they receive the proper training.

I. After entry has been completed the permit will be canceled by the entry supervisor. Cancellation of the permit indicates that the space is ready to be returned to its normal operation. A copy of the canceled permit shall be provided to Safety & Health Consultant.

J. Entry permits will be reviewed by the Safety & Health consultant and the Safety Coordinator yearly. The program will be revised as necessary to ensure that the health and safety of employees is not compromised.

4.5 Attendants

A. An attendant will be assigned to remain outside the permit required confined space at all times during entry operations. The attendant will remain in constant communication with the entrants and order the workers to leave if an suspected hazard occurs or a toxic reaction is observed in a worker. The attendant will also warn unauthorized persons not to enter the confined space.

B. The attendant will be equipped with communications (radio to Customer Service, or "voice link") and know who to contact in an emergency. The attendant will use a departmental radio during the normal work shift. After normal working hours the Duty Office will be informed of any entry into a confined space. And the Duty

Officer will ensure there is a means of communication available, to summon rescue and emergency services.

C. Attendants will receive training in hazard recognition and rescue procedures. Training will be supervised by Safety & Health Consultant.

D. The attendant will notify the DGS Customer Service, and the Safety & Health Consultant prior to a permit-required confined space entry, and when the work is completed. The base operator will be prepared to notify the assigned rescue team prior to a confined space entry.(Des Moines Rescue Team)

E. The attendant will not enter the confined space for rescue purposes until help has arrived.

4.6 Entry Procedures

A. All permit-required confined spaces:

1. The designated person at the Department (Customer Service during normal hours)and the Duty officer after hours, must be notified prior to entering the permit-required confined space.

2. An entry permit will be properly completed by a qualified person prior to entry into the permit-required confined space.

3. Only properly trained and authorized individuals will be allowed to enter a permit-required confined space. Authorized entrants will maintain contact with the attendant.

4. Each individual entering a permit required confined space will, whenever practical, have a safety or retrieval line attached to a chest, body harness or wristlets. The other end of the line will be secured to an anchor point or lifting device outside the entry portal. The anchor point will not be secured to a motor vehicle in a manner that would pull the line out of the space if the vehicle moved. A retrieval line is not required if:

   a) A permit space has obstructions or turns that would prevent pull on the retrieval line from being transmitted to the entrant, or,

   b) A permit space from which an employee being rescued with the retrieval system has projections which would injure the employee if forcefully contacted, or,

c) A permit space was entered by an entrant using an air supplied respirator, and retrieval lines, if used, could not be controlled so as to prevent an entanglement hazard.

5. Any entry into a permit required confined space will require atmospheric testing for oxygen content, flammable gases, and potential toxic air contaminants by a properly trained individual. Each individual may be required to wear an air monitoring instrument if the confined space is large enough or has a potentially hazardous atmosphere.

6. During any confined space entry, all safety rules and procedures will be followed. Metal ladders will not be used when working around electrical equipment. There will be no smoking in a confined space. Any use of chemicals, welding, soldering or cutting must be pre-approved by the Safety Coordinator and the Supervisor. Adequate lighting will be provided.

7. Personal protective equipment, including respirators, will be provided to workers as necessary for safe entry into the permit-required confined space.

a) All PPE must be approved by the Supervisor or the Safety Coordinator.

b) An atmosphere supplied breathing apparatus will be used for entry into an unknown atmosphere. The Rescue Team, with self-contained breathing apparatus immediately available, must be present on-site if entry is into an atmosphere that is actually or potentially immediately dangerous to life or health.

8. Electrical equipment used in the confined space will be appropriate for the hazard and meet the requirements of the National Electric Code if a hazardous atmosphere is present.

9. Any condition making it unsafe to remove an entrance cover will be eliminated before the cover is removed.

a) When the cover has been removed, the opening(s) shall be promptly guarded to prevent accidental fall into the opening and prevent objects from falling into the opening.

b) Appropriate vehicle and pedestrian barriers will be used to protect workers.

B. Contractors who send their employees into confined spaces under the control of Department of General Services will be informed of the potential hazards, safety rules, and emergency procedures in effect at the Capitol Complex. A copy of

Department of General Services Confined Space Program will be made available to contractors upon request. Contractors are expected to fully comply with safety and health standards issued by the Department of General Services. (DGS)

C. **Atmosphere-controlled Permit-Required Confined Spaces:**

1. If the only hazard posed by the permit space is an actual or potential hazardous atmosphere that can be controlled by continuous forced air ventilation alone, then workers may enter the space without retrieval equipment.

2. Flammable and toxic air contaminants must be less than 50% of a "hazardous atmosphere" to qualify as an atmosphere-controlled space.

3. Continuous monitoring must be performed. Monitoring results must be documented on the entry permit every hour.

4. There may be *no* hazardous atmosphere within the space whenever any employee is inside of the space.

5. If a hazardous atmosphere is detected during entry:

   a) Each employee shall leave the space immediately;

   b) The space shall be evaluated to determine how the hazardous atmosphere developed; and,

   c) Measures shall be implemented to protect employees from the hazardous atmosphere before any subsequent entry takes place.

6. The entry supervisor shall verify that the space is safe for entry, shall document pre-entry safety precautions taken and air monitoring results, and shall complete the form provided in Appendix A. This certification shall be made prior to entry, and shall be made available to each employee entering the space.

D. **Fully Regulated Permit Spaces:**

1. Workers entering a permit space containing a hazardous atmosphere or other uncontrolled serious health or safety hazard will wear full retrieval equipment except as allowed otherwise in this document.

2. Full retrieval equipment must be worn if it is likely that a hazardous atmosphere will develop or return.

3. Retrieval equipment will be secured to an anchor point or lifting device outside of the entry portal. The anchor point shall not be a motor vehicle. When vertical retrieval may be necessary, a lifting device such as a tripod equipped with either a powered hoist or a manual hoist. Where a manual hoist is used, the hoist shall offer at least a three-to-one pull ratio.

4. The Rescue Team will be notified prior to entry.

4.7 Reclassification Of A Permit-Required Confined Space

A. A permit space that poses no actual or potential hazardous atmosphere may be entered as a non-permit confined space if:

1. The permit space contains no actual or potential atmospheric hazard, and all other hazards within the space can be eliminated without entry into the space. Hazards may be eliminated, for example, by:

a) Following all designated lockout-tagout procedures for the space in question;

b) Emptying a vessel to remove an engulfment or other content hazard;

c) Draining chemical tanks of their contents, purging any residual chemicals with water, and ventilating the space after purging is complete;

d) Shutting boilers down, opening all access ports to allow for temperature reduction and natural ventilation, and by taking all appropriate designated measures to lockout/tagout, blank or block, and so forth to isolate the space.

B. If it is necessary to enter the space to remove any residual hazards (such as buildup that could fall upon entrants), then this entry shall conform to the full requirements of the permit entry program.

C. If hazards arise within a permit space that has been declassified to a non-permit space, each employee shall exit the space. The Supervisor and the Safety Coordinator shall then reevaluate the space and determine whether it must be reclassified as a permit space.

D. The permit space may be reclassified as a non-permit confined space for as long as the non-atmospheric hazards remain eliminated.

4.8 Reclassification Of A Confined Space To A Permit-Required Confined Space

A. When there are changes in the use of a non-permit confined space that may increase the hazards, the space shall be reevaluated and classified as a permit-required space if necessary. Reclassification would be required, for example:

1. During application of solvents, paints, chemicals or other materials that could potentially create a hazardous atmosphere in a confined space.

2. During welding, cutting, brazing or soldering in some confined spaces with limited ventilation.

B. The Department and the Safety Coordinator shall reevaluate and reclassify confined spaces as necessary depending upon the work activities to be performed in these spaces.

4.9 Rescue Procedures

A. If it is necessary to rescue workers from a permit-required confined space, the attendant will immediately notify the appropriate base operator that a permit-required confined space emergency has occurred. Capitol police, and the Duty officer will be notified after normal working hours. The base operator and/or Capitol police will acknowledge the call and the supervisor will be in contact with the Duty officer in case the duty officer needs to contact the rescue team. The Safety Consultant will also be notified.

B. The Des Moines Rescue team will coordinate the rescue effort.

C. After notifying the base operator, the attendant will attempt to retrieve the worker using the retrieval line. Under no circumstance will the attendant enter the confined space until help has arrived, and then only with the proper rescue equipment. Attendants participating in the rescue effort must have receive specialized training in confined space rescue techniques.

D. Rescuers entering an IDLH or unknown atmosphere will wear a self-contained breathing apparatus or a positive pressure airline respirator with a ten minute escape bottle of air. Rescuers will, where practical, be connected to a safety line attached to a point outside the confined space. An attendant will remain outside the confined space during rescue efforts. Rescuers will wear appropriate protective clothing.

E. Air-purifying respirators shall not be used in confined space rescues.

F. Rescue breathing equipment will not be required if the emergency is not due to the presence of a hazardous atmosphere.

Appendix A Confined Space Training Outline

OSHA Standards for General Industry 29 CFR 1910.146

(g) Training. (1) The employer shall provide training so that all employees whose work is regulated by this section acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this section.

(2) Training shall be provided to each affected employee:

(i.) Before the employee is first assigned duties under this section;
(ii.) Before there is a change in assigned duties;
(iii.) Whenever there is a change in permit space operations that presents a hazard about which an employee has not previously been trained;
(iv.) Whenever the employer has reason to believe either that there are deviations from the permit space entry procedures required by paragraph (d)(3) of this section or that there are inadequacies in the employee's knowledge or use of these procedures.
*((d)(3) states that: **Permit-required confined space program.** Under the permit space program required by(c)(4) of this section,(states that if the employer requires employees to enter a confined space the employer shall: (1) Develop and implement the means, procedures, and practices necessary for safe permit space entry operations, including, but not limited to, the following:*
(i) Specifying acceptable entry conditions;
(ii) Isolating the permit space;
(iii) Purging, inerting, flushing, or ventilating the permit space as necessary to eliminate or control atmospheric hazards;
(iv) Providing pedestrian, vehicle, or other barriers as necessary to protect entrants from external hazards; and
(v) Verifying that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry.)
(3) The training shall establish employee proficiency in the duties required by this section and shall introduce new or revised procedures, as necessary, for compliance with this section.
(4) The employer shall certify that the training required by paragraphs (g)(1) through (g)(3) of this section has been accomplished. The certification shall contain each employee's name, the signatures or initials of the trainers, and the dates of training. The certification shall be available for inspection by employees and their authorized representatives.

Training will include, but not be limited to:

A. Preparation.
   1. Isolate the space
      a. Explain the need for isolation of the space.
      b. List the types of isolation methods.

c. Evaluate an isolation procedure.
d. Explain how to test for proper isolation.

2. Purge and clean the space
   a. Define purging and cleaning.
   b. Explain the need for purging and cleaning.
   c. List common purging and cleaning methods.
   d. Evaluate a purging and cleaning procedure.

B. Air Quality Concepts
   1. Ventilate the space
      a. Define ventilation.
      b. Explain the need for ventilation.
      c. Evaluate a ventilation procedure.
      d. Describe possible additional precautions when a space cannot be ventilated.
      e. Explain the importance of specialized ventilation equipment.
   2. Testing the atmosphere
      a. Explain how to test.
      b. Recognize test equipment types and limits.
      c. describe proper conditions for testing.
      d. Explain the significance of testing the atmosphere in the proper sequence.
      e. Explain the importance of properly calibrating testing and monitoring equipment.

C. Plan the Entry
   1. Explain the purpose and importance of a pre-entry plan.
   2. Identify topics that should be discussed during the pre-entry plan.
   3. List the benefits of reviewing an emergency rescue plan.
   4. Recognize the need for special equipment.
   5. Explain the importance of reviewing respirator selections and precautions for use.

D. Entrant Duties
   1. Recognize symptoms of hazard exposure
      a. Describe symptoms of oxygen deficiency.
      b. Describe symptoms of exposure to toxic atmospheres.
      c. Describe symptoms of claustrophobia, disorientation and panic.
      d. Describe symptoms of exposure to extreme heat and overexertion.
   2. Maintain proper contact with attendant
      a. Explain the purpose of continuous contact with attendant.
      b. Relate the attendants role to personal safety.
      c. List acceptable methods for maintaining contact.
   3. Evacuate the space when necessary
      a. Describe the three situations when you should evacuate the space.
      b. Explain why to notify the attendant during a self-rescue.

E. Attendant Duties
   1. Recognize signs of hazard exposure
      a. Describe signs of oxygen deficiency.
      b. Describe signs of exposure to toxic atmospheres.
      c. Describe signs of claustrophobia and panic.

d. Describe signs of overexposure to heat and overexertion.

2. Judge when to order evacuation
   a. Recognize conditions and actions inside and outside the space that can create uncontrolled hazards.
   b. List circumstances when evacuation should be ordered.
   c. Judge the need for evacuation in a simulated entry.
3. Initiate proper emergency procedures
   a. Explain why rescue must not be done by attendant.
   b. Explain proper notification steps.
   c. List information that will assist rescuers.

BASIC CONFINED SPACE ENTRY AND RESCUE EQUIPMENT.

Equipment shall include, but is not limited to:

Safety Cones
Safety Vest
Barricades (as required)
Men Working Signs (as required)
Safety Flags
Manhole Hook (or pick)
Combustible Gas Detector(Gastech - air monitor)
Utility Ropes
Safety Harness
Safety Ropes
Fire Extinguisher
First Aid Kit
Safety Ladder
Tri-pod-retrieval winch
Self Contained Air Units (10-minute portable tank)
Hard Hats
Safety Glasses
Safety Shoes
Gloves
Face Shields
Body suits complete
Rescue Telephone Numbers
Radios for two-way communication
Ventilation Equipment
Explosion proof lights
Ground fault interrupters for extenuation cords

Hotwork Permit Checklist

Iowa State, Capitol Complex - DGS
Hot work Permit

Permit No._____

General Information

Work site Identification _____

Hot work to be performed:_____

Location/Building _____

Authorized Duration of Permit:

Date: _____ To: _____

Time: _____ To: _____

SOURCE OF IGNITION

_____ Acetylene torch
_____ Abrasive saw
_____ Electric Arc
_____ Electric tools
_____ Heliarc welding
_____ Propane torch
_____ Soldering
_____ Drilling
_____ Other: _____

SOURCE OF IGNITION

THIS HOTWORK PERMIT MAY BE SIGNED AND HOTWORK AUTHORIZED ONLY AFTER SATISFACTORY COMPLIANCE WITH ALL ITEMS OUTLINED IN THIS PERMIT.

_____ Floors swept clean of combustibles?

_____ Remaining combustible or flammable materials 35 feet horizontally as well as vertically from source of heat?

_____ Non-movable combustible or flammable materials isolated, covered/shielded with fire retardant material?

_____ Vertical and horizontal openings within 35 feet sealed or covered for spark/vapor control?

_____ Heat transmission, conduction, radiation controlled?

_____ Hazardous material transfers disconnected within 60 feet of hot work?

_____ Lockout/Tagout of electrical, mechanical, chemical, blanking cap piping implemented?

_____ Vessels, equipment drained, purged, ventilated, cleaned?

_____ Inert gas blanket required?

_____ Welding, cutting fume ventilation or respirator required?

_____ Work areas and adjacent areas where sparks may have spread checked out 30 minutes after work completed?

_____ Fire watch provided during work and 30 minutes after completion of work?

_____ Building/area air currents and outdoor wind direction known?

_____ Hazardous material spill release equipment and countermeasures available?

_____ Supervisor notified work location and time of operation?

_____ Involved personnel and contractor employees advised of hazards?

_____ Means of egress identified and available?

_____ Fire protection equipment available and operational?

_____ Automatic fire extinguisher system operational?

_____ Oxygen-rich environment evaluated?

_____ Continuous monitoring of atmospheric conditions maintained?

_____ Checking for flammable/combustible gas and oxygen levels?

_____ Special danger, caution, warning signs posted?

_____ Trenches over 4 feet deep shored or sloped?

IOWA STATE, CAPITOPL COMPLEX - DGS
HOTWORK PERMIT

APPROVALS AND AUTHORIZATIONS

This permit is valid only so long as work conditions existing at the time of issuance continue. It expires on any change in conditions that adversely affect safety of the work area while work is in progress.

STOP WORK IMMEDIATELY IF EMERGENCY ALARM SIGNALS AN EMERGENCY IN OR NEAR YOUR WORK AREAS. FOLLOW FIRE INSTRUCTIONS.

I have personally inspected the location where the above work is to be done. I have checked for compliance with the safety precautions listed on the permit and authorized the work to be performed.

Title	Printed Name	Signature	Date
Supervisor(Job)			
Safety Officer			
(Worker)			

****

THIS PERMIT MUST BE POSTED ON JOB SITE - - GOOD ONLY ON INDICATED DATE.

****

CONFINED SPACE ENTRY PERMIT
CAPITOL COMPLEX -- DGS

Description and Location

Name of Confined Space: _____

Location: _____

Potential Hazards (Permit-required hazards are in bold italics)

Hazardous Residue:	[ ]	**Hazardous Atmosphere:**	[ ]	**Engulfment:**	[ ]
Flash Fire:	[ ]	**Electrocution:**	[ ]	Poor Lighting:	[ ]
Minimum Work Room	[ ]	**Moving Machinery:**	[ ]	Poor Footing:	[ ]
Solid Mat'l. In-flow	[ ]	Injury/Sudden Illness	[ ]	Hot Surfaces	[ ]
Solid Mat'l. Out-Flow	[ ]	Respirable Dust:	[ ]	**Fall Hazard:**	[ ]
Steam/Hot Wtr in-Flow:	[ ]	Other: [ ] _____			

Other: [ ] _____ Other: [ ] _____

Required Precautions Before Entry

Isolate and Lockout: [ ] _____

Test Space for : %O_2 [ ] %LFL [ ] ppm H_2S [ ] ppm CO [ ] Other [ ] _____

Barricade Opening: [ ] Ventilate: [ ] Other: [ ] _____

Required Precautions During Entry

Ventilation:	[ ]	Respirator:	[ ] _____
Monitor Atmosphere:	[ ]	Other PPE:	[ ] _____
Safety Harness/Lifeline:	[ ]	GFI/I.L.V. Equipment:	[ ] _____
Retrieval Hoist:	[ ]	Other:	[ ] _____

Emergency Action Plan

Entrants shall immediately self-evacuate if a hazard is detected or perceived. Attendant should use nearest telephone or two-way radio to call 911 to summon emergency assistance. If entrant is attached to a lifeline, attempt to extricate without entering the confined space. Attendant must *not* enter the space to perform an unassisted internal rescue.

Emergency Response Information

Agency Designed To Respond to an Emergency: _____

Entry Point: Top [ ] Side [ ] Depth: _____ Small Entry Opening: [ ] (24" or less)

Hazardous Chemicals: Yes [ ] No [ ] Chemical Name: _____

Authorization

Permit Issued By: _____ Date Issued: ___/___/___ Expiration Date: ___/___/___

Scope of Work: _____

Hot Work Authorized: Yes [ ] No [ ] Scope: _____ Comments_____

Signatures of Authorized Entrants & attendant - May Alternate: Yes [ ] No [ ]

1. _____ 2. _____ 3. _____

4. _____ 5. _____ 6. _____

CONFINED SPACE ENTRY PERMIT

Minimum Conditions For Entry

If conditions are not met, entry is prohibited. If occupied, the space must be immediately evacuated.

Oxygen	Minimum 19.5% and Maximum 23.5%	Flammable Dusts	Must not reduce visibility to<5'
Flammable gases	No greater than 10% of LFL	Engulfment hazards	No engulfment hazard may be present
Hydrogen sulfide(H_2S)	No greater than 10 ppm	Hazardous flows	Must be secured & Locked/tagged out
Carbon monoxide(CO)	No greater than 50 ppm	Hazardous energies	Must be secured & locked/tagged out
Other toxic substances	No greater than PEL for substance	External hazards	External hazards must be controlled

Record of Confined Space Air Testing

Date	Name	Monitor #	Confined Space	% Oxygen	% LFL	ppm H_2S	ppm CO

Certification of Hazard Elimination for Reclassifying a PRCS to Non-Permit

Hazard	Verification of Hazard Elimination
Hazardous atmosphere	Eliminated Yes [ ] No [ ]
Entrapment hazard	Eliminated Yes [ ] No [ ]
Engulfment hazard	Eliminated Yes [ ] No [ ]
Hazardous energies	Eliminated Yes [ ] No [ ]
Other serious hazards	Eliminated Yes [ ] No [ ]
Work-created hazards	Eliminated Yes [ ] No [ ]
All PRCS hazards have been eliminated and the space has been reclassified to non-permit. The space may be entered without an attendant and the use of retrieval equipment.	*Name:*

Reviewed/Canceled By: _____ **Date:** _____

Comments: _____

PRE-ENTRY CHECKLIST FOR NON-PERMIT CONFINED SPACES

Name of Confined Space: _____

Location of Confined Space: _____

Checklist Completed By: _____ **Date** _____

Minimum Conditions For Entry

If conditions are <u>not</u> met, entry is prohibited. If occupied, the space must be evacuated.

Oxygen	Minimum 19.5% & Maximum 23.5%	Flammable dusts	Must not reduce visibility to <5'
Flammable gases	No greater than 10% of LFL	Engulfment hazards	No engulfment hazard may be present
Hydrogen sulfide(H2S)	No greater than 10% ppm	Hazardous flows	Must be secured & locked/tagged out
Carbon monoxide(CO)	No greater than 50% ppm	Hazardous energies	Must be secured & locked/tagged out
Other toxic substances	No greater than PEL for substance	External hazards	External hazards must be controlled

Certification of Hazard Elimination

Hazard	Verification of Hazard Elimination
Hazardous atmosphere	Eliminated Yes [ ] No [ ]
Entrapment hazard	Eliminated Yes [ ] No [ ]
Engulfment hazard	Eliminated Yes [ ] No [ ]
Hazardous Energies	Eliminated Yes [ ] No [ ]
Other serious hazards	Eliminated Yes [ ] No [ ]
Work-created hazards	Eliminated Yes [ ] No [ ]

Record of Confined Space Air Testing

Date	Name	Monitor #	Confined Space	% oxygen	%LFL	ppm H2S	ppm CO

EMERGENCY PROCEDURES

If the hazardous condition is detected or perceived, immediately evacuate the confined space. Do *not* re-enter. Inform your supervisor of the situation. No person will re-enter the confined space until all hazards have been re-evaluated and eliminated. In the event of an emergency, use nearest telephone or two-way radio to call 911 to summon emergency assistance.

APPENDIX B

List of Confined Spaces

Name of Confined Space and/or Code #	Location	Hazards					**TYPE** Permit-Required Non-Permit
		Hazardous Atmosphere [X]	Engulfment Hazard [X]	Entrapment Hazard [X]	Hazardous Energies [X]	Other Hazards (Specify) [X]	

Instructions: Customize manual by adding the results of a workplace confined space survey. List each confined space identified in the workplace to identify its name, location and associated hazards and indicate whether the space is non-permit or permit-required. Prepare copies of the form as required.